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ABSTRACT

Implications for the administration and organization procedures of schools were derived from assumptions on the learning process and, specifically, the individualization of instruction; the concept of the community as the school should be implemented, interrelating organizational patterns of administration should start with the student and feed back to the student, and professional educators at all levels should be willing to assume new roles and assist in the creation of new practices within the administrative organization. (SP)

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THE NEW TECHNOLOGY: ITS IMPLICATIONS FOR ORGANIZATIONAL AND ADMINISTRATIVE CHANGES

by John O. Bolvin*

One of the major weaknesses in the entire educational program today is the failure to recognize developments in technology and the implications these developments have upon the formal organization and structure of an educational institution. The present organization and administrative procedures employed in educational programs are not willing nor able to adjust to the instructional innovations that are currently coming onto the scene. Francis Chase in the 1966 NSSE Yearbook, The Changing American School, states:[1]

> "Organizations and institutions, like individual organisms, tend to react to changes in their environments in ways which will perpetuate themselves. Sometimes the reactions appear to be unreasoned and largely defensive; sometimes they show evidence of calculation and planning. Sometimes the response is slothful; sometimes partial; sometimes prompt, but irrelevant; and sometimes characterized by foresight, orderly planning, and comprehensiveness. The more stable an organization or institution is and the more deeply it is entrenched in the larger society, the more difficult it may be for it to respond to changes in the environment. Hence, the so-called social lag--the piling up of challenges year after year without

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[1] Chase, Francis. "School Change in Perspective." In Goodlad, John I. (Ed.) The Changing American School, The Sixty-fifth Yearbook of the National Society for the Study of Education. Chicago: University of Chicago Press, 1966. Pp. 271-306.

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> corresponding reactions on the part of social organizations and institutions until the cumulative effect becomes so great as to produce abrupt change in or even destruction of institutions--is always a real and present danger in education ..."

The implications new technology has upon the organization and administration of educational institutions seem to indicate that major changes must take place if the new technology is to have a real effect upon instruction.

To get some insight into this problem, one only has to consider the possible effects that implementing programmed instruction into three or four subject areas would have upon the organization and administration of that entire school. If programmed materials do help students advance at varying rates, then the system presently employed of defining a course as a year's work would have little meaning. Promotion and advancement would be a continuous process, not something occuring at the end of the year. In turn, this continual progress would have an effect on the entire scheduling procedures. Additionally, the implementation of programmed instruction would change the role and function of the teacher. Rather than being able to prepare a full-year's work before beginning the year, the teacher must be prepared to handle pupils at varying stages as they advance through the various content areas. A change in the teacher's role consequently changes the role of the administrator and supervisor, and so on it goes that just from the implementation of a single innovative program, one can see the changes necessary for the total school structure.

In considering the topic, what changes might be necessary in the organizational pattern and administrative procedures of schools and colleges for new technology to effectively improve instruction, one probably should start with what is meant by effectively improving instruction. One way of defining instruction would be the process of education in shaping a pupil's behavior toward achieving certain competencies. In this sense, instruction would contain two parts--the resources and the plan. Resources would include the teacher, learning materials, techniques of instruction available, the setting, and so forth. To plan effectively for instruction, several basic elements must be present. These are: 1) a definition of course objectives for the goals of instruction; 2) a knowledge of the student's entering behavior; 3) the resources, the techniques of instruction, and the instructional procedures that are available for assisting the student in moving from one goal to another; and 4) techniques of assessing student performance as to when he reaches the desired goals.

Bearing this in mind when considering the effective improvement of instruction, an additional factor enters the picture. When talking about effectiveness we are talking about effectiveness in terms of the pupil. This means that most instructional plans should be centered on the student and not a group of students. In view of the above, this is where the role of individualization comes into instruction. Since individualization is an important theme permeating education today, it is worthwhile to look at one model for individualization and the implications this model presents for school organization and administration.

The definition of individualization most commonly used is that the individualization of instruction requires the adaptation of the educational environment to individual differences. The working aims of a model for individualization are derived from this definition which include: 1) to provide for reliable assessible individual differences among learners, 2) to develop mastery of subject matter as the child moves through the curriculum, 3) to develop self-directed and self-initiated learners through instructional procedures that provide for self-selection and self-evaluation, and 4) to provide opportunities for the child to become actively involved in the learning process.

To meet these aims, the components of the model are as follows:

1. Well-defined, sequentially established, curricular objectives for each subject area.

2. Procedures and processes for diagnosing student readiness, needs, and accomplishments in terms of the objectives of the curriculum and the characteristics of the learner.

3. The necessary instructional materials for individualizing learning providing a variety of paths for attainment of mastery of any given objective. These instructional materials must be developed to permit self-direction, self-initiation, and self-evaluation on the part of the learner.

4. A system for providing individual lesson plans or prescriptions for each student prepared especially for him designating the learning tasks that the

student is ready to undertake, suggested materials and techniques of instruction, and the standard of performance expected as an outcome.

5. Strategies for information feedback, either through the use of para-professionals or data processing equipment to provide the student and the teacher opportunities for continuous evaluation and assessment, and

6. The reorganization of the total school environment doing away with the arbitrary boundaries usually designated as grades but substituting organizational patterns to permit continuous progress. This reorganization typically provides opportunities for two or more staff members to work and plan together for the same students, reallocation of duties and functions because of the involvement of para-professionals, and more freedom of movement on the part of the students.

To effectively improve instruction, certain assumptions are implied in this model. These are: 1) providing more effective self-study on the part of the learner; 2) planning the instruction of each student to maximize success in learning; 3) having available a variety of materials and resources related to various styles of learning; 4) the teacher must be provided with relevant information concerning the student's abilities, aptitudes, past achievements, success or lack of success on present assignments, and what materials and resource options are available at any given

time, etc.; 5) the students can move through the curriculum at varying rates of speed; 6) the curriculum must be spelled out in detail prior to beginning instruction for any given child in order that the particular path for that child can be determined in light of future learning goals and past achievement; and 7) instruments for assessing student characteristics be available at all times for the teacher to select in order to determine the style of learning, past accomplishments, etc., on the part of the learner. In addition to these assumptions is the assumption that individualization of instruction cannot be done without the application of the new technology.

The implications these assumptions have for the administration and organizational procedures for the schools shall be examined in terms of the equipment and resources necessary in the schools, the time, the space available, personnel, and the community and family involvement.

1. Equipment and resources. From the assumptions made concerning the improvement of instruction, one can readily determine that there is a need for instructional resources for self-study on the part of the learner. A great deal has been written about the pros and cons of certain self-study materials, and the qualities and quantities that must be available. Even though there are many unresolved questions regarding these materials such as what types of stimuli are needed, what pacing techniques are necessary, how immediacy reinforcement must be in terms of students' responses, what prompting and amount of practice are necessary for different students, and so forth, individualization cannot be accomplished without the availability of self-study materials.

The need for self-study materials implies that certain types of equipment and resources be readily available prior to beginning instruction. Since the equipment must be operable by students, it will vary depending on the age of the child, the learning outcomes desired, the type of material with which the child will be working, and the facilities available to house such equipment. One thing is certain, when individualizing instruction the teacher no longer has the opportunity to develop and create materials for students to work with prior to beginning the instructional process. Assorted materials must be available for reading, viewing, listening, writing, and for doing various activities under the supervision of the teacher. Facilities to house such materials should be spaced throughout the building in order that supervision and monitoring can be carried out by the teaching staff..

In addition to equipment and materials that assist in the learning process, it is also necessary to have equipment that provides the teacher with information relative to the student's past accomplishments and current progress. Computer equipment can store the relevant information and upon demand feed back to the teacher information which is needed to assist him in decision making when planning the student's learning experiences.

2. Time. The component of time and its effect upon the organization and administration of schools will have a profound effect with the application of new technology. Today, educational time at all levels reflects the many constraints group instruction imposes on the educational system. We generally think in terms of the school day beginning and ending

at the same time for most students. We think in terms of "periods" when scheduling students to various activities. We think in terms of the "school year" or, at least large segments of time in the school year such as quarters, to begin groups of students in a particular learning activity. We think in terms of "courses," "Carnegie units," "credits," etc. based upon time in studying and learning. However, as we project to the time when learning is based on the needs and characteristics of an individual learner, the present constraints must be removed.

Present technological devices no longer make it necessary for groups of students to begin learning the same thing at the same time. Students can be introduced to new topics through films, video tapes, records, etc., and the amount of practice that a given student needs can be provided through paced learning with technological devices. When a particular child needs review, it can be provided for. Selected elements within a particular content area for which a given student can skip or pass over can be provided for through the new technology. All these factors tend to eliminate the need for the September opening and June closing of schools. If it is desirable for students to spend 200 days during the school year (which is very much open to question), there is no need for this time to be the same 200 days for all children. The "year around" school begins to take on a different concept. Students can spend their 200 days spread throughout the entire 365-day year. In a similar way, the time spent in studying different content areas should vary from individual to individual. The time that an individual spends in each of the content areas will vary for that individual. The use of technology will provide opportunities for the

learner to remain with particular tasks depending upon his needs in that task and not the needs of the group. The differentiation between the regular school time and the after school time and the differentiation of tasks that are performed during these two times begin to take on different meaning. The type of instruction provided in the regular school time and the type of instruction provided in the after school time can be similar. The present model of correspondence courses may be closer to the model used for home study than the use of "home work" as presently viewed.

Time is also reflected in terms of personnel or staff of the school. When we think in terms of time for a professional staff, it is now possible to think about planning time during the school day not held by the constraint of group instruction. Time to teach takes on a different meaning, time for professional development becomes integrated with the regular school time, and so it goes. The component of time as we now consider it and the component of time with the new technology drastically changes the concept of school which, in turn, changes drastically the organization and administration practices of the educational institutions.

3. Space and facilities. The design of space and facilities must reflect the school's educational program. Since it is assumed that with the application of new technology the school's program will provide for more effective learning which, in essence, provides for more individualization in the planning and conducting of instruction for each student, space and facilities must be different than the building as we now know them. The equal-sized classrooms presently existing in most schools grew

out of the position that teachers should have an equal load of students and students should be divided into groups according to age or ability with instruction generally being given to the entire group or, at best, two or three sub-groups. In place of the equal-sized classrooms, the facilities needed include: (1) Individual learning stations (both wet and dry-type carrels) spaced throughout the building yet housed in such a way that students' activities do not interfere with those of the other learners. (2) Student viewing rooms and small conference rooms must be provided for students to work with other students or for a teacher to work with small groups of students. (3) Science and math laboratories for individual and small-group activities must be provided. (4) The library as we now know it will become more of a learning resource center than it is presently. However, not all library catalogue materials will physically be found within the library. In essence, the library will permeate the entire school with individual learning carrels tied into an information retrieval system coordinated from the central library facility. Close to or as a part of the library should be student reading rooms. (5) Space must be provided for large- and small-group instruction. One change that technology will make in the utilization of space is the need for large-group instruction as presently being proposed by many educators. As you read the educational literature on buildings, the purpose of the large-group instruction area is to provide large-group instruction when possible in order to free teachers to work individually with students or to work with small groups of students. The application of technological devices

will change the need for large groups from this point of view. Technology makes it unnecessary to have large groups of students together in order to free other teachers to meet with a small group. However, this does not rule out the need for some large-group instructional areas within the school facility. The purpose for which they are used and the amount of time they will be used will change. This means that the space needed for large groups must be flexible to get maximum use of space for maximum time. Changes necessary for students result in changes for teachers and other supportive staff. These facilities would include individual and team planning areas for teachers, a central information center accessible to all concerned, and administrative, health, food service, etc. as necessary.

4. Personnel and staff. The implications of new technology and the assumptions for improving instruction have been viewed in terms of equipment and resources, time, and space and facilities. Now let us look at the implications in terms of personnel and professional staff. Relative to personnel, the assumptions presented above imply changes in duties and responsibilities of various persons now assigned to the schools, as well as the addition of new types of assignments not found in most schools at the present time. Both of these factors will be considered when discussing the changes for personnel.

Since the core of the instructional program (in terms of staff assignments) begins with the teacher, any examination of the organization

should begin here. Denemark[2] in an article, "The Teacher and His Staff," listed the following duties and responsibilities of teachers under the present conditions:

"Today's teachers are expected to ...

1. Remain alert to significant developments in academic specialty and continue general education in order to avoid obsolescence of knowledge

2. Be a continuing student of the educative process and keep current with respect to innovations in teaching methods and materials

3. Plan with students and fellow workers

4. Work with curriculum committees

5. Experiment with different content, methods, and materials and keep systematic records of such studies

6. Read and evaluate student work

7. Confer with students and parents regarding pupil progress

8. Counsel and advise students on academic, vocational, and personal concerns

9. Maintain a cumulative file of significant data on each student

10. Develop reading lists, outlines, study guides, drill sheets, and visual materials

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[2]Denemark, George W. "The Teacher and His Staff." NEA Journal, December, 1966.

11. Prepare tests appropriate to the range of objectives established

12. Type and duplicate tests and other materials for classroom use

13. Arrange for field trips, outside speakers, and other programs relevant to the learning objectives of the class

14. Supervise homeroom, study hall, or luncheon

15. Supervise playground or recess periods

16. Advise student extracurricular groups, chaperon school functions

17. Keep attendance and academic records

18. Collect money for various drives and sell tickets for school events

19. Order and return films and other visual aids and operate equipment involved

20. Participate in professional-association and learned-society activities

21. Maintain an active interest in civic and community affairs and represent the school in the community

22. Orient and assist beginning teachers

23. Supervise student teachers and cooperate with area colleges in providing opportunities for observation and demonstration."

With the application of technology, certain roles of the teacher will change, some will be deleted, and other functions will be added.

When applying new technology, teachers first of all will need an operationally sound theory of instruction to assist them in making the many decisions in planning for the student's educational development. The teacher's role in assessment, diagnosis, and planning will be the most important factors to be influenced by the new technology. The teacher will be required to make more and more meaningful decisions regarding exactly what it is that the given child is ready to do, what would be the best way for the child to accomplish the task, and when is it that the child should be changed to another mode of learning or moved on to another learning task.

The specificity of decision making required in self-instructional systems is not as crucial in the present teacher-centered situations. Under the present group-type learning situations, discrepancies and omissions in planning can be corrected as the teacher moves through the learning situation with the children.[3] However, when we begin to consider individual plans and self-instructional materials, independent learning, small-group instruction, the resources and plans must then be carefully thought out before instruction begins, must be carefully monitored throughout the instructional process, and carefully evaluated with the termination of the instructional plan. In order to have the time and resources necessary for proper decision making, certain organizational changes are necessary.

To provide flexibility and to adapt even now to some of these differences among individual students, the concept of team teaching has been

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[3]Loughary, John W. Man-Machine Systems in Education. New York: Harper & Row, 1966.

employed. When considering the implications of improving instruction, one begins to re-evaluate and re-consider the concept of team teaching. One change is a need for teams consisting of professional and para-professional personnel with differentiated task assignments. Many of the present team teaching programs provide some differentiation in the roles of team members. The teams are generally made-up of a team leader, some senior professional teachers, several intern teachers, teacher aides or technicians, and clerical aides. When considering the needs of individualized instruction, then the make-up of this team in terms of differentiated staff roles would follow very basically this same type of team operation.

The team leader, for instance, presently is considered to be an experienced, mature, master teacher of unusual talents. This person usually possesses a master's degree and is able to supervise other persons, is able to initiate change, has a firm knowledge of the learning process in the goals of education for the particular institution, and knows the community and students attending the particular school.

Depending on what level of education is being considered, the senior teachers on the team would either be subject specialists for a particular subject or generalists for several content areas as in the lower levels of education (the primary and intermediate grades for instance).

The intern on the team is generally a trainee who is involved in a teacher education training program and working under full-time supervision within the particular school. However, unlike the present situation where a given teacher trainee is often assigned to a single teacher for supervision and training, the interns on a team are usually assigned to

the team and operate with various teachers and professional personnel within the team structure.

The teacher assistants and technicians assigned to the team are usually mature adults who have had some training in working and supervising student activities. In many cases, these persons will make instructional decisions. However, the professional teaching staff has generally set limits within which these decisions must be made. These persons also relieve the teacher of much of the routine teaching duties such as supervising recess and lunch periods, supervising the arrival and departure of students to and from classes, supervising students involved in various activities independent or small group, supervising project and laboratory situations, helping the student to obtain materials, and general housekeeping-type duties.

The technician will assist the students in learning how to operate the various mechanical devices for himself, to keep the devices fundamental, to be aware of the placement of various devices, and to keep the entire team alerted to the introduction of new mechanical aids that will assist the teachers in assigning student activities.

On the other hand, clerical aides will relieve the teacher and the team of many non-teaching tasks such as typing, filing, recording, duplicating materials, assisting the child in obtaining materials, and the general clerical duties that are now either not employed or are done by the teaching staff as part of their regular assignments.

When examining the 23 teacher expectations given by Denemark, certain roles assigned to the teacher can now be removed and reassigned to members of the team. These deletions include: (1) Maintaining a cumulative file of significant data on each student. With the assistance of para-professionals and such technological changes as the computer, the teacher no longer maintains a cumulative file. This file is maintained for all teachers to use and the teacher simply calls up that information which is relevant for her or him at a given time. (2) Developing reading lists, outlines, study guides, skill drill sheets, and visual materials no longer becomes the responsibility of a single teacher. (3) With the utilization of retrieval systems, it is possible for a school or groups of schools to maintain an up-to-date file coded to various learning outcomes that would provide the team with reading lists, outlines, types of study guides available, and what kinds of visual materials are available for a given outcome. (4) The teacher no longer would be required to prepare tests for groups of students as done in most schools at the present time. These instruments would be prepared and stored for teacher utilization. To individualize instruction, this is not only desirable but necessary if we want to assess the student along various parameters as he moves through the learning process. (5) The typing and duplicating of tests and other materials for classroom use will no longer be a necessary role of the teacher. This task will be handled for all teachers by clerical assistants provided to the team. (6) The supervision of homeroom study halls, lunch room, playground, recess periods, etc. can all be assumed by para-professionals, thus freeing the teacher to have time to plan with fellow teachers and students, and to keep current with the trends in educational practices.

One must be careful, however, in generalizing the roles of various teams for different levels of education. For example, some aspects for teaching very small children will remain a human enterprise with technological devices being used sparingly and for very specific purposes. Implied here is that teams working with three- to eight-year old children would have a much smaller pupil-adult ratio than, say, teams working with 12 through 16- or 17-year olds. However, in teams working with all age groups, certain ideas can be generalized; e.g., when considering differentiated staff roles, we can also consider differentiated pay for the persons within these staff roles. The team leader would be a highly-paid professional person receiving a salary based upon a 12-month period and commensurate with administrative salaries of educational personnel today. Teachers on the team can be differentiated in terms of desire and request on the part of the teacher. There can be those teachers who wish to be professional personnel, working 12 months a year from eight in the morning until five, and receiving salaries commensurate with the time and additional effort they put into a job. At the same time, there can be other professional teachers on this team who, because of outside commitments (e.g., wives and mothers), would rather work for nine or 10 months per year and possibly prefer to work from four to six hours a day. Through their own choosing, these persons would receive somewhat less in terms of salary than would full-time teachers on the team. Needless to say, the salary structure for paraprofessionals would likewise be commensurate with their background, training, and responsibilities.

As the differentiated team concept is explored, it becomes obvious that the principal's role begins to change. In most schools, the principal is referred to as the school administrator responsible to some degree for supervision of teachers; other professionals and para-professionals; budgets; transportation; food services; public relations; physical plant design, utilization, and maintenance; teacher in-service education; identification and implementation of innovations; research; pupil scheduling; etc. With the development of instructional teams some of these duties are transferred from the principal to the team. These include supervision, pupil scheduling, in-service education, and many more. Many management functions now required of the principal can be assisted, simplified, and transferred to others by the implementation of technology. Thus, the role of the principal will become more limited permitting this position to be better defined and better staffed. The principal's role as educational leader and coordinator begins to emerge as the primary responsibilities of such a position.

Directly related to the changing role of the principal is the introduction of additional specialists into the organizational structure of the school. One of these specialists might be termed the "educational engineer." The major role of the educational engineer will be to assist the schools in bridging the gap between research and practice. One assumption that underlies the need for this sort of person is the inevitable increase of information and knowledge about learning and the learning process that will be available as we apply technology to the system. The education and training of persons for this position should include a strong

background in the behavioral sciences with some emphasis in educational research. However, with such a background there is one word of caution that must be injected.

> "The successful educational engineer should probably have all of the training and instincts of the behavioral scientist. As such, he may often find guesswork and the inelegance of trial-and-error distasteful. He will be tempted to behave like a basic researcher, but this sort of behavior does not add directly to useful social invention. If the educational engineer is employed by a local school system, the economic sanction and social obligation which accompany his publicly-defined position will serve to bind him to a practical commitment."[4]

To be effective, the educational engineer would work with and through the principal with each team providing a resource that is currently missing in nearly all educational programs.

Other positions presently existing that will take on different functions or roles include: guidance staffs, curriculum coordinators, supervisors, and health service personnel. As the role of the teacher becomes more associated with instructional decision making and planning for individual students, the implications this has for involving guidance personnel as resource persons become obvious. It is evident that with the tremendous expansion of knowledge and information, individuals must begin to select alternatives for concentration. As educational institutions, schools must build into the system the opportunity for students to become actively involved in the decision-making process.

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[4]Anderson, Richard C. "The Role of Educational Engineer." J. of Edu. Sociology, Vol. 34, 8, April, 1961. Pp. 337-388.

One role of the guidance staff should be to assist the student and teacher in formulating more meaningful long-range goals and, in turn, developing and implementing instructional programs that assist the student in reaching these goals. Closely related to this function is the necessity for relevant information concerning the student that is used in developing the instructional plans. Since instructional decisions are related to all characteristics of the learner, the guidance staff must be supported by specialists such as: psychologists, social-case workers, psychiatrists, medical and dental persons, and other specialists that presently serve the students but are often completely independent of the student's instructional experiences. It should be the role of the guidance staff to coordinate and translate information from these specialists to teachers and students.

When attempting to relate the present functions of curriculum coordinators and supervisory personnel to future demands of schools, several assumptions regarding curriculum building and decision making are implied. First of all, the present practice of curriculum building that supposedly goes on in most schools should be questioned. The research and development functions necessary before a new instructional program should be implemented requires both large amounts of funds and the involvement of many specialists that are not generally available to most school districts. An examination of the costs and professional imput that are necessary in developing instructional programs such as the newer science and mathematics programs, should serve as examples of what is implied. However, the local school districts should be involved in this process by 1) assisting in the

identification of needs for instructional programs, 2) assisting in the establishment of aims and purposes of these programs, and 3) assisting in field testing and the implementation of these programs into local schools. Thus, the role of instructional curriculum directors and supervisors relate to these functions in developing instructional programs.

The second set of assumptions effecting the role of curriculum coordinators and supervisory personnel are those related to decision making. In most educational institutions today it is assumed that "decisions are made at the top." This statement implies a hierarchy of decision making that is not applicable when considering potential changes in roles suggested to this point. The teachers plan <u>with</u> the students. The teacher plans <u>with</u> other teachers. The teacher plans <u>with</u> other professionals and para-professionals. The guidance staff <u>assists</u> the <u>teacher</u> and <u>students</u> in decision making. The curriculum directors plan <u>with</u> other agencies as well as <u>with</u> local staffs and community for goal setting. The principal works <u>with</u> and <u>through</u> the teams for management and educational improvement. All of these statements imply a complex organizational structure that is yet to be developed. However, this structure must be developed before we can efficiently improve instruction through the use of modern technology.

4. <u>Community and family involvement</u>. One of the major effects new technology should have upon the educational institution is the clarification of the roles of the community and family in the educational process. Up to the present time, the involvement of the community has been limited and often ignored for a variety of reasons. To make education more

relevant for more people, it is now necessary to actively involve the community in: 1) examining and assisting in establishing the goals and purpose of education; 2) assisting in developing the educational needs related to vocations; 3) providing opportunities for learning experiences related to the individual student's goals; 4) providing information from all community agencies to a central source about individual students; 5) sharing in the instructional program by providing resources, facilities, and personnel to enrich the education environment; and 6) cooperatively working with educational institutions to provide for continuous educational developments of all people in keeping with the changes of supply and demand of the labor market. In general, what is implied is that educational decision making at all levels must involve the community and eventually the family.

The general effect new technology has already had and what it would have upon the family has been a major concern of many social scientists today. The decision as to the effects it could have should not be made by various institutions separately, but rather examined cooperatively. For example, should we provide public education for three- and four-year olds through "nursery schools" or could these same experiences be provided in homes through technological processes? Should much of the student's independent work be provided in the home rather than in the schools? Both of these questions imply that through the use of technology it is not always necessary to bring students to a central facility for all systematic learning experiences but it is possible to provide the same types of learning in the home. Assuming that the outcomes are the same or similar in both instances,

it then becomes a question as to which is more desirable in terms of the family and other social institutions.

Summary. In essence, there are many organizational and instructional changes that must take place if the new technology is to effectively improve instruction. The limited view of the "school house" must be erased and in its place the concept of the community as the school must be substituted. The "hierarchy" of line and staff from chief school administrators, to assistants, to principals, to teachers, to students must be replaced with several interrelating organizational patterns that start with the student and feed back to the student. Finally, before technology can have an effect upon instruction, professional educators at all levels must be willing to forfeit certain traditional roles and practices by assuming new roles and assisting in the creation of new practices within the administrative organization.

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